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# Self-care management among older adults with Diabetes Mellitus: A systematic literature review

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**Summary**

The alarming rise of diabetes mellitus (WHO 2016) and the experiences of the author in encountering patients with diabetes mellitus complications due to poor self care have been the motivation to conduct the study.

The study intends to identify the factors that supports the maintenance and adherence of self-care management among older adults with diabetes mellitus. This will bring ideas to the nurses as educator and motivator to patients with diabetes mellitus as to how to encourage them in performing self-care activities. The study used a qualitative systematic literature review approach and content analysis of the 10 relevant articles that discuss about the study topic.

The findings of the study has suggested three categories: **personal factors** which comprise the subcategories *cognition*, *physical status*, and *medication*; **social factors** which include the support given by the *family & friends* and the *diabetes care projects or programs;* and **health care personnel factors** which discuss the relationship of patients with *physician* & *pharmacy service*. These categories contributed to the maintenance and adherence of self-care management among older adults with diabetes mellitus.

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Language: English Key words: Diabetes mellitus, self-care, management, adherence, diabetes program, nurse

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# 1 Introduction

In the past years, the prevalence of diabetes mellitus has been rising, and it is now considered to be a big health problem and the fourth among the noncommunicable diseases that need to be addressed (WHO 2016, 6). This alarming numbers of diabetes mellitus affecting people and the encounter with patients with diabetes mellitus have been the motivation of conducting the study. The proponent of the study encountered many patients with diabetes mellitus in the last clinical work practice. Most of these patients have acquired different kinds of complications due to lack of management and adherence to treatment and care. This experience prompted the proponent to study and understand deeper the complexity of self-management and care.

According to WHO (2016, 21-23), about 422 million adults in 2014 are affected by diabetes mellitus which has doubled compared to the data from the year 1980. It has been the culprit of 1.5 million deaths in 2012 which considered to be the eighth leading cause of death worldwide among both sexes, and it has been the considered a risk factor of cardiovascular deaths and chronic kidney diseases. In the European region, the prevalence rate of diabetes mellitus has almost doubled in numbers from 5.3% in 1980 up to 7.3% in 2014 which corresponds to the 33 million people from 1980 up to 64 million people in 2014.

The Finnish Diabetes Association (n.d.) has estimated 50 000 people have type 1 diabetes mellitus, 300 000 people with type 2 diabetes and 150 000 undiagnosed cases of diabetes mellitus type 2 living in Finland. On the other hand, the Statistics Finland (2015) reported 483 deaths across all ages due to diabetes mellitus and 361 of it are older adults with age above 65 years old.

Diabetes mellitus is a metabolic disorder where the pancreas could not produce or produce an insufficient amount of insulin which is needed for blood glucose regulations and the metabolism of proteins and fats. The types of Diabetes Mellitus type 1 and type 2. If not managed, diabetes mellitus can lead to multiple organ complications such as retinopathy, kidney failure, lower limb amputation, cardiovascular diseases and endstage renal-diseases (WHO 2016,11-12 & 30).

A diagnosis of diabetes mellitus, which is a chronic disease, can change a life of a person as the primary treatment for the type 1 diabetes is insulin, which is injected for the rest of the life of the patients (Scobie & Samaras,40). On the other hand, the treatment of type 2 diabetes mellitus includes an individualized and holistic approach focusing on dietary plan and increased physical activity. The management is done by a multidisciplinary team consisting of a physician, nurse, dietitians, podiatrists and even psychologists ( Samaras & Scobie, 62-65).

The vital aspect of diabetes care is a lifestyle management through diabetes self-management education and support, proper nutrition, exercise, quitting cigarette smoking, psychosocial care, and counseling. It is a collective work of the care providers and the patient in implementing an effective diabetes care and maintains a quality of life during diagnosis, follow-up of care and the prevention of complications and management of comorbid diseases with (American Diabetes Association 2017, s33).

# 2 Aim & Problem Definition

The general aim of the study is to investigate the factors that support the maintenance and adherence of self-care management among older adults with diabetes mellitus. It will specifically look how these factors impact their self-management towards attaining a healthy lifestyle. The study aspires to shed light on the importance of good self-care management adherence among older adults with diabetes mellitus.

The question that will be used as the foundation of the study include:

1. What are the factors that support the maintenance and adherence to self-care management among older adults with Diabetes?

# 3 Theoretical Background

This chapter intends to provide vital information about the focus areas of the study which consists of diabetes mellitus, aging and support system in self-care management.

## 3.1 Diabetes Mellitus

Diabetes is a chronic metabolic disease of the ability of the body to metabolize glucose, fat, and protein due to insulin resistance and insulin deficiency or the inability of the pancreas to produce enough insulin. The lack or absence of insulin suppresses glucose metabolization which draws the body to use fats and proteins instead. However, fat metabolism produces ketone bodies which can lead to ketosis, and the break down of protein can cause muscle weakness, lethargy, and weight loss (ADA 2010; Samaras & Scobie 2014; WHO, 2016).

According to WHO (2006), the prevalence of diabetes mellitus has been rising over the past years, and it is considered a priority and a significant public health problem in noncommunicable diseases that must be addressed by the leaders of the country.

## 3.2 Diabetes Mellitus Type 1 and Type 2

There three types of diabetes mellitus are diabetes mellitus type 1 (T1DM), diabetes mellitus type 2 (T2DM), and gestational diabetes mellitus WHO (2016). This study focuses on types 1 and 2 diabetes mellitus.

Diabetes mellitus type 1 which is known as insulin-dependent, juvenile or childhood-onset diabetes has a hallmark sign of insulin deficiency due to the loss of function of the beta cells in the islets of Langerhans by secreting insulin. This leads to a different array of symptoms such as weight loss, vision changes, fatigue, and the most common for all which are urination and thirst, and persistent hunger and most specifically, hyperglycemia (Samaras & Scobie, 2014; WHO, 2016).

According to ADA (2010, s63), the destruction of beta cells varies by person as it can happen fast in children or slow in adults. The first manifestation of children and adolescents is usually ketoacidosis.

Samaras & Scobie (2014) mentioned that the classical symptoms of diabetes mellitus type 1 may occur over an extended period as the beta cells that are left in the islets still can release a small amount of insulin for months or years. The symptom emerges when about 90% of the beta cells in the islets of Langerhans are destroyed.

The leading causes of diabetes mellitus type 1 are unknown or idiopathic, but this may be attributed to the interaction of active genetic and environmental factors (e.g., viral infections) which are still not defined clearly. Diabetes mellitus type 1 is usually characterized it with the existence of autoantibodies in the beta cells of the islets of Langerhans causing immune-mediated cell destruction such as in type 1a. On the other hand, there is no evidence of autoimmune participation in type 1b (ADA 2010, Samaras & Scobie, 2014; WHO, 2016).

Diabetes mellitus type 2 (non-insulin-dependent or adult-onset diabetes) occurs when there is the ineffective utilization of insulin in the body (insulin resistance), or there is reduced secretion of insulin that could not provide the demand of the body (beta cell failure) which can be associated with degraded lifestyle habits. The symptoms of diabetes mellitus type 2 may be the same compared to that of type 1. However, ketoacidosis does not typically happen in people with diabetes mellitus type 2 as a complication since there is no total loss of insulin in the body which prevents the breakdown of fat (Brady et al., 2013; Samaras & Scobie, 2014; WHO, 2016).

The presumption that diabetes mellitus type 2 as a lifestyle disease has been proven wrong as genetic (ethnicity, family history of diabetes, past diagnosis of gestational diabetes) also play a role to the emergence of the metabolic disorder. But this is strongly influenced by other factors such as sedentary lifestyle, unhealthy eating habits, overweight and obesity and smoking (Samaras & Scobie, 2014; WHO, 2016).

## 3.3 Complications

Diabetes, when neglected, can put health at risk due to complications and life can be compromised. Acute complications can lead to reduced quality of life or even death. Hyperglycemia can trigger critical medical emergencies such as diabetic ketoacidosis (DKA) in both types, and hyperosmolar coma which can happen only in type 2. Hypoglycemia can occur in all types of diabetes. The abnormally low blood glucose may affect the level of consciousness and progress to coma, seizure, brain injury, and death. This status might be a result of poorly timed or overdosed insulin, too many physical activities, not taking or a low glucose deficient meal. Chronic complications can damage blood vessels, kidneys, nerves, eyes, gums and increase the chances of stroke and heart disease. Reduced blood flow along with neuropathy in the feet can lead to foot ulcers which can be the reason for a leg amputation. Diabetic retinopathy is the reason for vision loss and blindness brought about by the damage of small blood vessels in the retina. One of the principal causes of kidney failure is diabetes mellitus (WHO, 2016).

## 3.4 Management

Organized health services offer essential interventions and follow up that are needed to assist people with diabetes to live longer and maintain healthy lifestyle, given the condition is chronic and progressive. These responses are affordable and attainable even in low-resource locations. Monitoring blood sugar levels and checking the risk of heart diseases by counseling to promote a healthy life with diet, exercise and medicines is the best option to avoid complications(WHO, 2016).

Countries with enough data on trends over time are likely to reduce the number of diabetes-related complication because of the management of the essential factors such as smoking, blood pressure, lipid levels, blood glucose and the structure's quality of care (WHO, 2016).

### 3.4.1 Insulin Replacement Therapy

Samaras and Scobie (2014) cite a study in 1993 that has proven the help of intensive insulin therapy in delaying the occurrence and progression of microvascular complications due to diabetes. Insulin can be differentiated into two types according to derivation: Animal-derived insulins (from porcine and bovine) and human insulin preparations which are commonly used nowadays.

The beta cells in the islet of Langerhans secrete the insulin, and it is stimulated by the rise of blood glucose after eating. It acts as a key to let the glucose enter the cell for utilization and storage; it also facilitates metabolization of proteins and fats. Thus, it is essential for the survival of a person (Dunning, 2009, 121).

Replacement of insulin among people with diabetes mellitus aims to approximate and obtain an acceptable range of blood glucose and lipid levels through blood glucose measurement and insulin supplementation, to prevent hyperglycemia and hypoglycemia, and to improve the overall quality of life as it is a chronic disease (Dunning, 2009, 122).

### 3.4.2 Glycemic Control

The purpose of glycemic control such as glycated hemoglobin (HbA1c) is to verify the effectiveness of the management of the person with diabetes regarding nutrition, exercise, and medical management. A target of HbA1c between 6% and 7% are considered to be normal. Medical management is indicated when fasting glucose levels is above 7 mmol/L or it is above ten mmol/L after meals. However, the healthcare team must provide a sensible and individualized approach to managing diabetes especially in elderly who are at more risk for hypoglycemia (Samaras & Scobie, 2014).

### 3.4.3 Diet

|The fundamental principle of dietary recommendations for diabetes for the last 30 years is a low saturated fat diet. Breakdown of a macronutrient is made up of less than 30% of

energy from fat (with less than 10% from saturated sources), 50-60% of energy from carbohydrates and 20% from protein. It is necessary until now to restrict cholesterol for a low saturated diet and lessen cardiovascular risk (Samaras & Scobie, 2014).

Both type 1 and type 2 diabetes insulin-treated patients receiving meal-time quick acting insulin (single or premixed form) should have a meal with carbohydrate. Standard portion sizes and exchanges of carbohydrates for patients are used as a reference to make sure the insulin dose before meal ensure enough carbohydrate to avoid after meal hyperglycemia or hypoglycemia. Glucose testing after a meal can assist to establish the right premeal insulin dose. A dietitian specializing in insulin-treated patients can give precise counseling to patients treated with premeal insulin. (Samaras & Scobie, 2014).

### 3.4.4 Weight loss

According to Samaras & Scobie (2014), Weight reduction is a very challenging aspect in the management of Diabetes Mellitus since weight gain can be a side effect of medical therapies such as sulfonylureas, thiazolidinediones, and insulin. A personalized and individualized approach to weight loss is better as people are different to one another, but the vital component for successful weight reduction is endurance and consistency in calorie restriction diet.

### 3.4.5 Physical activity

The foundation in the managing diabetes mellitus is to strengthen physical activity. It increases the action of insulin lessening the chances of heart disease and stroke. It is also vital in losing weight. People with diabetes are advised to have 20 minutes 3 days per week exercise, at an intensity of 50% VO 2 max (i.e., 50% of maximal aerobic capacity). A level where a person can talk in brief sentences only. Patients with weight problems are encouraged to exercise daily longer in lower intensity than mentioned above, 40 minutes walking in a day is enough. This may be perfect for older patients with the condition that prohibits the more prolonged physical activity. (Samaras & Scobie, 2014).

## 3.5 Education

Education on self-management provides knowledge and the skills needed for self-care activities that aim for an optimal clinical and health outcomes and quality of life (ADA 2017, s33).

Education for a newly diagnosed type 2 diabetes person is vital for their cooperation in their health management. The role of education is to empower and inform the individual. For the majority, a diagnosis of diabetes can be depressing, so a cautious approach helps avoid patient's disempowerment, denial, and fatalism. (Samaras & Scobie, 2014).

Adults can lessen the possibility of acquiring type 2 diabetes and have a better insulin sensitivity and glucose uptake by proper diet with fiber and polyunsaturated fats instead of saturated fats and adequate exercise. WHO is recommending diet and exercise that, if followed can lessen the risk of type 2 diabetes and NCDs (WHO, 2016).

WHO (2016), with the Food and Agriculture Organization (FAO), recommend limitation of fatty acid intake to less than 10% of total energy intake and 7% for the high-risk group; minimum intake of 20g dietary fiber from legumes, wholegrain cereals, fruits, and vegetables. WHO's guideline on fat and carbohydrate intakes is being an update including dietary fiber, fruits, and vegetables. The organization extremely recommends less than 10% or until 5% reduction of free sugars intake. WHO (2016) suggests physical activity according to age group:

- 5-17 years old children and youth - at least 60 minutes moderate to intense exercise daily
- 18-64 years old adults at least 150 minutes of moderate-intensity aerobic physical activity in a week or at least 75 minutes vigorous-intensity aerobic physical activity in a week or an equivalent intensity combination.
-older adults same amount is recommended including balance and muscle strengthening activity according to their ability and condition

## 3.6 Support by the Family & Health Care

A study of Ghimire & Gurung (2014) has shown that family support and visit influenced the quality of life and effect of the nursing care among the elderly. Thus, presenting the significance of social support and emotional relationship in the care of older. Additionally, Mayberry & Osborn (2014) has found out that participants highlighted the importance of the motivation and behavioral skills of the family and its impact on the diabetic medication management of the participants. The nonsupportive behavior of the family has discouraged the participants to adhere to the management.

The role of the nurse is vital in the diabetic management plan of the patient. The nurse works independently as a patient educator, teaching concepts and interventions in the scope of the nursing practice. The significant objectives of diabetes management education are autonomy and empowerment; emphasis on the psychological and social aspect of the disease; open dialogue and active communication; improvement and learning of new practical skills; supporting and discussion of the concerns of the clients; and sharing of new related information to the experience of the patient (Dunning, 2009, 452).

Patient empowerment in self-care such as encouraging patients to make pro-active decisions and the harmonized collaborative work of the healthcare team optimize the promotion of diabetes management reducing disease-related complications (Kent, D. et al., 2013).

According to the study of Visentin, A. et al. (2016), The implementation of educational actions by the health care team to patients with diabetes mellitus expands learning and foster healthy habits in the family. An excellent and well-trained support network that provides an efficient educational process in the management of diabetes encourages better management adherence and self-care. The nurse as a teacher and facilitator must be consistent in relaying information and giving feedback to the client and must able to carry the job as a reinforcer of the instructions provided by the other health care team members (Dunning, 2009, 452).

The nurse must know when is the right time to teach the patient ‘teaching at a teachable moment’ emphasizing the kind environment that they are in and focus on the individual

needs of the patient. Nurse-patient education can be done during routine nursing care, and the nurse must consider the importance of a non-verbal aspect of communication by being a role model by appropriately showing independent procedures to the patients (Dunning, 2009, 453). A study of Gundala, et al. (2016), have shown that there is a weak compliance,self-care and performing preventing practices in diabetes management among the participants with lower literacy rates thus increasing their awareness and knowledge is essential.

## 3.7 Old Age & Ageing

Old age or senescence is considered to be the last stage of the typical lifespan. It is defined as 60 or 65 years of age and older for statistics and public administration, but the definition may vary according to biology, demographics, sociology, and in the field of work (Britannica, 2016).

There many mechanisms as to how aging occurs over time resulting in the decline of overall cellular functions and its failure to sufficiently respond to damages from internal and external environment leading to metabolic problems. These include DNA mutations, mitochondria failure and damages caused by free radicals and atypical proteins build-up ( Farley et al., 2011, 8-9).

Farley et al. (2011, 11) have listed five theories on ageing: error theory which describes the decline of DNA functional ability causing gene alterations, the free radical theory explains how free radicals and oxidative stress cause chronic diseases, Immune theory which describes the immune system function decline, programmed theory of aging which tells the disruption of cell replication due to telomeres deficit and neuroendocrine theory which represents the reduction of hormonal secretion of the body which goes with age.

### 3.8 Diabetes in Older Adults

The management of diabetes mellitus among people over the age of 65 is a complex and crucial facet of the provision of healthcare as the prevalence of the disease is congruent with the increasing age. An elderly person with diabetes mellitus can experience multiple physical and mental functioning problems that impact self-care ability, independence and psychological well-being such as glucose metabolism, problems in chewing and swallowing, cerebral and peripheral vascular and cardiac problems, nervous system problems, visual problems, renal problems, stress and depression, cognitive impairment and musculoskeletal disorders (Dunning, 2009, 348-354).

Self-care and its maintenance among older adults with diabetes mellitus type 2 are challenging and demanding. Assessment of self-care ability must be assessed from time to time during health-care provider and patient interaction (Dunning, 2009, 367).

## 4 Theoretical Framework

The theory of Dorothea Orem has been used for this research. Her approach has advocated that the maintenance of optimal health and wellness is achieved through self-care, which is the ability of the person to care for themselves and those who need it.

Orem has given the nurses the role of the nurse as an advocate, support person, redirector, educator and provider of a safe and therapeutic environment to the patient. The goal of care is to guide people to be capable of taking care of their own or their dependents (Snowden, A. et al., 2010, 276-277).

Parse has separated three conceptual categories from the theory of Orem: self-care, self-care deficit and nursing system (Snowden, A. et al., 2010, 277).

## 4.1 Theory of Self-Care

According to Orem and Parse, self-care is the maintenance of vital biopsychosocial health and wellness in the context of the environment, health, and nursing. They both believed in the presumption that self-care behavior could be learned through external variables such as experience and education. Three components of self-care were established: universal self-care needs, developmental self-care needs and health deviation (Snowden, A. et al., 2010, 277).

Orem (1987, 212-213) defined self-care as autonomous and self-directed continuous actions performed by adults that cater the regulatory needs of their functioning and development. It requires knowledge and array of skills to be able to take care of self and dependent-care which is taking care of family members. Also, it requires the understanding of the relationship between the different aspects of self-care including exercise, diet, and medical management and the need to harmonize them in daily life.

Self-care requisites are the execution of self-care activities in a given time. The requisite is not synonymous with health or well-being but how a self-care action brings a desirable impact on the person (Orem 1987, 218).

Orem enumerated the three components of self-care requisites and their definitions: Universal self-care encompasses the basic needs of the people like food, air, water, personal and social needs, and so on; Developmental self-care involves the developmental changes that one has to conquer; and Health-Deviation self-care which are the needs that are addressed during disability or illness (Snowden, A. et. al, 2010, 278).

## 4.2 Theory of Self-Care Deficit

Orem described self-care deficit as the inability of the person to perform self-care activities because of restrictions, and it includes the provision of assistance and care given by the self-care agencies to the individuals, who are complete, partially, or incapable of performing self-care. The intervention should focus on meeting the needs of the person by identifying the problem and managing it. The role of nursing and the nurse is defined as the

caretaker who meets the existing and anticipatory needs of the patients (as cited in Snowden, A. et al., 2010, 278).

### 4.3 Theory of Nursing Systems

Orem highlighted that the theory of Nursing System encompasses both the theory of self-care deficit and the theory of self-care. The focus of this is the person as the recipient of therapeutic self-care from the self-care agency. Self-care is classified into three types: Wholly compensatory is the provision of complete assistance and care to the individual, Partially compensatory is the implementation of interventions both by the nurse and patient, who may be restricted to carry out things, as they work together to meet the needs of the patient; while supportive-developmental is when the nurse provides only supplementary health information to patients who can perform the self-care activities independently (Snowden, A. et al., 2010, 279).

According to Orem (1989, 282), The theory of nursing system is the core of the self-care deficit theory of nursing. However, it can not stand alone without the theory of self-care deficit and the theory of self-care as they for a general theory of nursing together. The nurses, as the agency, produce the actions in the nursing system to attend the self-care deficits of the people and to provide a therapeutic self-care that will meet their needs and demands.

## 5 Methodology

The methodological process of the study is comprised of data collection and data analysis written in a systematic approach. A systematic literature review and a deductive content analysis have been used as the method of this qualitative study.

According to Holloway, I. et al. (2017, 3-4), qualitative research, as a social inquiry, aims to understand, describe and interpret the core on how people grasp and decipher social phenomena in the forms of behaviors, feelings, and experiences.

## 5.1 Qualitative Systematic Literature Review

Aveyard (2010, 6) defined literature review as a comprehensive study and interpretation of articles in line with the study question that has been identified. The literature review can be done through systematically searching, analyzing and discerning the contents of the gathered relevant articles discussing a particular similar topic which leads to the development of new perspectives.

The importance of literature review is that it condenses and make sense all the gathered articles with the similar chosen topic as there are already a lot of information readily available in the fields of health and social care. But for an academic analysis to be done, it is essential to consider the value and linkages of one article to another with the same topic and not jump to conclusions right after reading just one item. Items that are evidence-based must be systematically reviewed (Aveyard, 2010, 6-7).

Polit & Beck (2010, 171-172) mentioned that the significant steps in doing literature review includes using primary sources as the articles for study and avoid secondary sources such as existing literature reviews and non-research references such as opinion articles, case reports, and clinical anecdotes. A high-quality review guarantees that it is comprehensive and thorough, it includes up-to-date references, it is systematic, decision rules must be well-defined and explicit, and it should be reproducible, balance and unbiased.

The qualitative content analysis is the breaking down of the contents of the gathered historical data and extracting prominent themes and looking for patterns among them through use of charting devices in (Polit & Beck, 2010, 469). According to (Polit & Beck, 2010, 469), The theme is the unit that unifies the nature or basis of the data by giving meaning and identity to them.

## 5.2 Ethical Consideration

The significance of Ethics in health care is to guide health professionals in protecting and preserving the dignity and well-being of the clients. This also serves as a guide to

balancing the ethical principles and rules governing research process. Holloway, I. et al. (2017, 52-53) have viewed ethics as a broad concept of the comprehension and examination of moral life that encompasses principles, rules, rights, virtues and ethical ideals. They have presented four basic principles in ethics – the principle of respect for autonomy which give the patient the freedom to choose and the right for informed choice and self-determination; the principle of nonmaleficence and beneficence which both demand healthcare researcher to balance and carefully look through the benefits and risk of procedures that will be done to the respondents or patients ; and the principle of justice which is the fair and just treatment to the respondents regardless of age, gender, sexual orientation and disability.

Holloway, I. et al. (2017, 120-121) pointed that the documents used in the research must possess four characteristics: authenticity, credibility, representativeness, and meaning. Authenticity and credibility interrogate the history of the material and the intentions of the writers while accuracy involves the time, place and condition during the information acquisition. Representativeness is the figures of the papers about an event which can be challenging to prove. While meaning has been claimed to be the most significant part of the data collection and analysis with documents as it is the only characteristic that the researcher can probably perform through interpretation of the written text in the situation and condition that they are written and the purpose of the writer.

The study has gathered peer-reviewed articles from the search engine FINNA. The process involved a fair and honest task from the respondent in accordance with ethical principles and rights of the participants engaged in the study and the authors with regards to the use of documents. The study has been written and analyzed in the guidance of writing a well systematic literature review to avoid misinterpretations and misrepresentations.

## 5.3 Sources of Data

The study was conducted with the use of FINNA, a search engine that provides free access to all the library and electronic resources from the Novia University of Applied Science, Tritonia Library. Databases that were used in searching for the relevant articles or documents are EBSCO host and CINAHL.

## 5.4 Criteria for Selection

The criteria of selection guide the respondent to look for and focus on articles that are relevant to the study topic and questions and which are not. The well-defined inclusion and exclusion provides the needed information about the scope and relevance of the study and to avoid sidetracking with irrelevant data (Aveyard, H., 2010,71).

The inclusion of criteria was decided before the search of the articles, and they were as follow:

- Relevance to the study topic and questions (materials that study about older adults with Diabetes Mellitus or other related diseases and self-care management maintenance or adherence such as medication, physical activity, and diet.)
- Qualitative study (best balance)
- Peer-reviewed
- Written in the English language
- Full-text and free to access
- Publishing year is between 2006 and 2017

Exclusion criteria were as follow:

- Irrelevant studies
- Quantitative studies
- Secondary Sources
- Non-academic articles
- Unpublished studies or published pre-2006

Before searching the articles in the databases, keywords that are associated with the study topic or question were chosen and used in various combinations such as “Diabetes”, “adherence”, “management”, “self-management”, “medical”, “older adults”, “chronic disease”, “factors”.

## 5.5 Practical Implementation

After opening the webpage of Tritonia library, the respondent proceeded to click FINNA and logged-in with the Novia University of Applied Science student account. Then, the browse to databases was opened, and EBSCOhost and CINAHL were chosen respectively. The advanced search was then filled-up according to the list of the inclusion of criteria and filled the boxes with the corresponding selected keywords. The words "diabetes" and "management" which produced 95 hits and three articles were chosen out from them. The same process was done with the use of the keywords combinations, and they were all documented in the table of "matrix of data collection" (see appendix 1). With the use of other combination of keywords, it has shown that some articles were repetitively appearing which depicted the hits as inexact. The chosen articles were then written in the "matrix of qualitative articles" (see appendix 2), and they were printed for reading and analyzation in a deductive approach.

The analyzation has been done through the use of a table in Microsoft Word. Relevant findings in the form of phrases or paragraphs were gathered from the articles and were placed under the meaning unit. The meaning units were then scrutinized to extract their main ideas and points which are called tags or condensed meaning units. The table was re-read to look for similar ideas and points provided by the data. Common themes or categories were then identified and paired with the meaning units and tags. Sub categories were also defined. Then, they were compiled and used to answer the aim and question of the study.

# 6 Findings

The results have found out three categories: personal factors, social factors, and health care personnel factors as subtitles for this chapter. The **personal factors** discuss the *cognition, physical status,* and the *medication intake* as subcategories. The **social factors** comprise of the support given by the *family & friends* and the *diabetes care projects or programs* which are considered as subcategories. Lastly, **healthcare personnel factors** primarily discuss the relationship of the patients with the subcategories: *physician* & *pharmacy service*.

## 6.1 Personal Factors

The personal factors that influence adherence that was identified include *cognition, physical health status, and medication.*

***Cognition***

Acquirement of knowledge through health guidance, programs or lectures about diabetes mellitus facilitated management adherence and maintenance ( Korkiakangas et al. 2011, Rise et al. 2013, Holt et al. 2014). De Souza & Vendruscolo (2010) reported that respondents adhered to physical activity not only for its benefits to physical health but as well as to general health and well-being.

*"At the very beginning, I did as I was told. I started taking my medication and eating precisely on time, doing exercises and losing weight, going to have my blood and blood pressure checked every three months."* (Moser et al., 2008, 5)

*"I would think it makes a person more confident once he understands all that (e.i. what high blood pressure is, its effects, treatment for the disease, and consequences of nonadherence). He would be willing to set goals. The goal would be to set your blood pressure as close as possible to normal"* (Holt et al. 2014, 204)

The acquired knowledge has somewhat realized them to be more responsible. They were able to to make their own decisions and life and not depend on everything on the doctor.(Rise et al. 2013, 3)

*"What has changed is that before the course I thought my doctor had the responsibility for all this. But now I understand that it's me. I have to make the decisions myself, and I feel that I have taken control. If the doctor were the one who had responsibility, I would have eaten the wrong things because it wasn't my responsibility right. But now the responsibility is mine and I have to deal with the consequences."* (Rise et al. 2013, 4)

According to  Peeters et al. (2015), the lack of awareness about diabetes mellitus resulted in non-adherent with medications while Hsu et al. (2014) have found out that respondents who do not know or has difficulties managing their medication led to non-adherence.

*"Sugar disease, what is it in fact? Doesn't your throat work properly then? The throat doesn't make the sugar melt anymore?"* (Peeters et al. 2015, 94)

Forgetfulness and memory loss have been identified as barriers to management adherence to diabetes mellitus (Holt et al. 2014, Hsu et al. 2014, Peeters at al. 2015). Many patients forgot to take their medications (Holt et al. 2014). Mental problems such as depression and powerlessness impeded medication adherence as well ( Peeters et al. 2015).

*"And I even get to the point that's I don't even remember what the pills are that I'm supposed to have, you know. So, I just have to take all my pills up there with me and there's like 26 of them, and say " I need refills" And then they have to go through every single prescription to see when the refills are ready to be done.."* (Hsu et al. 2014).

"*We forget things that we used to not forget. I know. I'm 72 and sometimes I forget things. I'm quite sure that all of us forget sometimes"* (Holt et al. 2014, 202)

Knowledge acquisition has let them understand their health situation better and it has provided confidence to perform self-care activities and set their own health goals. Also, it has given them the realization to be more responsible. On the other hand, having memory loss and being forgetful has been an obstacle to the maintenance of self-care management.

***Physical Health Status***

The effects of exercise and diet have let them feel much better (Rise et al., 2013). Also, the decline of physical health and functional ability motivated people to adhere and maintain physical activity as one management of diabetes mellitus which promotes health, weight management, prevention and alleviation of complications, and independence of care (Korkiakangas et al., 2011).

*"Exercise makes you feel good, and something just makes you go out. As an older person. I feel that exercise helps you both your mind and body function… It feels important to keep*

*up my present level of physical fitness. Besides, exercise is fun and something just 'forces' me to go out into fresh air.."* (Korkiakangas 2011, 18)

The benefits of exercise and being physically well improved their feelings toward training. While according to de Souza & Vendruscolo (2010) decline physical health status such as pains can be a barrier to self-care management.

***Medication***

The side effects of medications and its interactions which has caused discomforts made the respondents nonadherent to medication regime (Holt et al., 2014, Hsu et al., 2014). While taking several pills at a time has been a concern to the respondents ( Peeters et al., 2015).

"*As you put it earlier about the libido thing. Oh God! You mean I'll be less if I take this medicine? I'm not ready to be less. So maybe I won't take it every day. I'll just take it every other day, or maybe I won't take it at all because I still want to perform. For a male, I think that would be a major, major thing. Even if you're not performing that much, you still want to think you can if you wanted to. I think that would be a big handicap as far as not willingly taking the medicine."* (Holt et al. 2014, 204).

Medications may have different effects on individuals that may upset them to take them routinely as prescribed. Also, polypharmacy raises concerns, especially for older patients.

## 6.2 Social Support

The support of family & friends or peers encouraged the respondents to the adherence or maintenance of self-care management and even in positive lifestyle modification ( Moser et al. 2008, de Souza & Vendruscolo 2010, Korkiakangas et al. 2011, Rise et al. 2013, Mladenovic, et al. 2014, Oftedal 2014, Holt et al. 2014, Peeters et al. 2015).

***Diabetes Care Projects or Programs***

Programs or projects catered to people with diabetes mellitus have stimulated lifestyle management adherence and maintenance ( Korkiakangas et al. 2011, Holt et al. 2014, Mladenovic et al. 2014).

*"I was starting to do just like my friends who stay in their pajamas and bed all day…If I had not started this program I would probably be depressed like my friends…..Here you talk about things, about the son, about the nephew, about a trip that you have made…You feel more alive…You start to have activity in your mind, If you stay home by yourself, you only think about bad stuff…For me it is a kind of analysis, I play, talk, forget my problems, do my exercise…It is therapy, what we do here!"* (de Souza & Vendruscolo 2010,8)

*"I liked that you'd check in and so it kept you more motivated, because they were looking at your (log book) – I felt I had to do the walking."* (Mladenovic, et al. 2014, 372)

According to Holt et al. (2014), "stigmatization" discouraged adherence to management but joining in a group of people with diabetes mellitus, where everyone behaves the same way, have lessened the stigma as the behaviors of performing diabetes self-care management have been considered to be "normal."

*"I just really enjoyed going to those meetings because it really give you a little family to talk to, someone who's in the same boat as you."* (Mladenovic, et al. 2014, 372)

*"You feel much, much more at ease with people in your age-group, in a group where everyone has some kind of limitation, where everyone has little problems, or most of them have…I think that one of the things that are important is that everyone has similar limitations!"* (de Souza & Vendruscolo 2010,9)

*"Every morning at 6:45 we take our medicine before we go walking. It helps us because we set a time to take our medicine before we go walking. Nobody forgets it, we all take it. I think it's good to have a buddy to walk with."* (Holt et al. 2014, 205)

The feeling of not being alone and unnormal has been provided by the diabetes care programs or projects. They feel lively and comfortable to be with people within their same

age group and problems. The programs have given them the motivation to do self-care activities such as exercises and taking medicines as it felt everyone is doing the same.

***Family Members & Friends***

Family members or close friends are seen as helpful in routinely taking medication among those who has problems with memory and forgetfulness (Holt et al. 2014, Peeters, et al. 2015)

*"She (the participant's wife) is my assistant. She cooks, she thinks with me, she takes care of the medication. I also do all these things, but she keeps me company in managing the whole diabetes thing, which is essential to me."* (Moser et al., 2008, 7)

*"I received incredible amounts of support, especially from friends helping me getting started exercising, for example by (their) joining me for walks and getting me to the gym."* (Oftedal 2014, 45)

Unsupportive family members and friends and their lack of knowledge about diabetes mellitus and their negative attitude demotivated people with diabetes mellitus to perform diabetes self-care management behaviors (Oftedal 2014). While, some have relapsed to non-adherent behaviors such as sedentary lifestyle after health programs were finished (Mladenovic et al., 2014).

*"I know personally that nagging demotivates me and makes me completely introverted."* (Oftedal 2014, 46)

*"Its just that this support can be annoying sometimes, for example, when you are at a part and you are referred to special food."* (Oftedal 2014, 46)

*"I don't like to walk alone. After every one of those exercise (sessions), I felt really good. It seemed like something had been accomplished. On my own, I don't have any sense of accomplishment whatsoever."* (Mladenovic et al. 2014, 372)

Family support and help have given the patient the sense of not being alone with his efforts in the daily life managing diabetes mellitus. The support and assistance keep them moving and getting on in performing self-care activities.

## 6.3 Health Care Personnel

The quality of health care personnel-patient relationship and the provision of care to the patients with diabetes mellitus influenced the adherence and maintenance to self-care management ( Holt et al. 2014, Peeters et al. 2015, Meranius & Hammar 2016). Open communication is a critical factor of adherence to medication adherence (Holt et al. 2014, Peeters et al., 2015).

***Physician***

Self-care has been seen as an interdependent behavior with the physician who will educate the patient about diabetes mellitus and the essential management such as medications and its effects and the prevention of complications (Meranius & Hammar, 2016).

*"I think a doctor has a some responsibility and a patient has some responsibility."* (Holt et al. 2014, 206)

*"I think if you have a friendship with your doctor (it) would help (with adherence). You would be more free to talk to him or her if you have a problem."* (Holt et al. 2014, 205)

Meranius & Hammar (2016) mentioned the factors that inhibit good physician-patient relationship which affects management adherence include the failure of a physician to educate the patient clearly, several physicians taking care of one patient and the lack of communication between the physicians, the attitude of the healthcare personnel, the system of managing diabetes mellitus.

*"but why doesn't the doctor find the reason for my problems? Then I think that the drugs are unimportant, or else the doctor would have bothered more about it."* ( Meranius & Hammar 2016,93)

*“ I think it’s a matter of prestige between the doctors. They don’t like to consult each other. The family doctor is not willing to make contact with the kidney specialist, nor is the cardiologist, who prescribed inappropriate tablets even though I asked him to consult the kidney specialist.”* ( Meranius & Hammar 2016,94)

Additionally, Communication barriers negatively impacted physician-patient relationship associated with management adherence and maintenance (Peeters et al. 2015, Meranius & Hammar 2016).

*“The doctor has been in such a hurry, by the way, all of them are. He is not Swedish and has difficulty understanding. They do not trust people who have problems with speech; even my own doctor does not believe me because I say the wrong words. It’s weird, when you have difficulty talking they think you don’t get it. I still want to participate in conversation.”* ( Meranius & Hammar 2016,93)

A good physician-patient rapport is a key to an open communication. Advice that is done in a clear and understandable manner to the patients will give them answers on the importance of medication with diabetes management. The relationship among the physician also affects as to how the patient sees the management.

***Pharmacy Service***

According to Hsu et al. (2014), The quality of pharmacy service also influenced the medication adherence. The accessibility to reach the healthcare personnel through calls or email and the use of systematic methods and technology such web-based refill tools and mailing of medications.

*“ I don’t have any problem ordering the medications when I want to order them, or I lose them. What I do is I call the nurse. They have a day nurse and a night nurse, another day nurse and sometimes they’ll say. “Ok, what’s the medication?” and they’ll say. “Ok go to the pharmacist. “ And just get a small amount of it. Until you go and see your doctor, or primary care.”* (Hsu et al. 2014).

The formation of consistent daily routine and the use of pillbox were seen as facilitators to adherence (Holt et al. 2014, Hsu et al. 2014).

"*I fill my canister on Sunday evenings. So at that time I'm looking at each vial of medication to determine how much I have lefts. So when I'm down to a week's left in a container. I'll call it in*." (Hsu et al. 2014).

Poor pharmacy service, coordination, and logistics are considered barriers to medication management adherence. The patient notices when there are something problematic with the healthcare organization and it affects the quality of medical and pharmacy service (Hsu et al. 2014).

*"But here a couple months ago, the (pharmacy) down here – messed up somehow. I don't know who did it or how they did it or whatever, but I kept calling them and calling them for 6 weeks, 7 weeks…I couldn't get ahold of a person."* ( Hsu et al. 2014).

*"I think it's a doctor-pharmacy problem. Because I see my physician every year, once a year, and sometimes more frequently than that, and there are still mix ups and cancellations. You know, I talked to my doctors about that, now with 2 of them, and from both of them at completely different offices are saying, they fight with VA pharmacy all the time to no avail. And now they're even saying. "If it has to do with prescriptions, go talk to the pharmacy because I don't get any different treatment than you do."* ( Hsu et al. 2014).

*"Because I took a lot of pills, I took less (OHA). I wanted to try it because I was bit worried."* (Peeters et al. 2015)

A well harmonized and coordinated health care organization provides a quality pharmacy service to patients impacting the quality of self-care management. However, it can also be a barrier to self-care management when there are confusion and discoordination among the healthcare organization.

# 7 Discussion of Findings

The results of the study have shown the importance of the individual self, the social support and the healthcare personnel working together about the adherence and maintenance of self-care management among older adults with diabetes mellitus.

The knowledge of the participants as to how significant physical activity to wellbeing is, its maintenance and the deterioration to health motivated the participants in the Finnish Diabetes Prevention Study to exercise (Korkiakangas et al. 2011). The participation to health program or courses such as talking and listening to lecturers who have diabetes and from sharing conversations with others have assisted the people with diabetes mellitus in the formation of new knowledge regarding the disease and the management (Rise et al. 2013). These findings favored the description of Orem (1987) in Renpenning & Taylor (2003, 212-213) that self-care is self-directed and self-permitted of knowing, doing, seeing the relationship of the self-care measures and its management on a daily basis to the maintenance of life and health and well-being promotion. It is learned through interaction with the social environment such as the family, friends, school and peer groups.

Social support has also reinforced motivation to adhere to self-care management. Sharing experiences and exercising together helped the formation of new habits (Korkiakangas et al. 2011). The support, love, and attention given by the teachers and peers in a program have encouraged adherence and positive health perception (de Souza & Vendruscolo, 2010). The spouses who prepared food and helped with the diet were perceived as very significant in the diabetes management(Oftedal, 2014). Social support also motivated the maintenance of the lifestyle changes (Rise et al. 2013). Although the study has not found any concrete and specific discussions on the work of Orem as to how social support from family, friends or peer groups on the adherence and maintenance of self-care among patients with diseases or illness, Orem (1987) discussed in Renpenning & Taylor (2003, 214), about dependent care which describes the care given to the dependent among the family members.

Older adults have pointed out that the education and re-education by the health care providers are the measures to address the barriers to knowledge, attitudes, and beliefs regarding diabetes mellitus and its management (Holt et al. 2014). The participation of the

patient with the medication management was considered important (Meranius & Hammar, 2016) and the establishment of a good relationship and open communication with the doctor were also significant in overcoming the challenges with regards to medication management(Holt et al. 2014, Peeters, et al. 2015).

Orem has focused more on the roles of the nurse about self-care management in her theory. Even though, the findings discussed more on the physician and the pharmacy-service in relation to the adherence and maintenance of self-care management among older adults with diabetes mellitus. The significance of these findings is that nurses work together with the physicians and the pharmacists.

Orem (1987) discussed the role of the nurse becomes much more significant in a health-deviation self-care as it requires them to identify the needs of the patients and the risky behaviors they perform.Nurses assist them in determining arising needs and initiate the adjustments with the current problems Renpenning & Taylor (2003, 219). Orem (1956) as in Renpenning & Taylor (2003, 258), has defined nursing is a practical and didactic art of providing specialized services to people with disabilities in necessary daily care and to engage them with the medical management given by the physician. Nursing aims to encourage independence of doing care and assist the significant others of the patients to cooperate with the provision of care. According to Orem (1978) in Renpenning & Taylor (2003, 115), The nurse role in supportive educative systems is to give assistance and teachings to the self-care agent or patient, and the patient performs self-care activities independently.

# 8 Discussion of Methodology

According to Holloway, I. et al. (2017, 309-310), A sound and adequate qualitative research can be developed through five criteria: dependability, credibility, transferability, confirmability, and authenticity.

Dependability means consistent and accurate by methodologically conducting the study by using audit trail. The proponent has used Microsoft Word to tally all the gathered relevant

articles for the study and a Microsoft Word table was used to show the development of the analysis thoroughly.

Credibility is the compatibility of the perceptions of the participants of the study with the interpretation of the researcher (internal validity). The study had used 10 relevant articles to obtain a right amount of information to be analyzed. The content analysis has been done systematically with the guidance of the supervisor of the study proponent.

Transferability which means that the gathered knowledge from one study can be applied in different settings. The criteria selection was made to make sure that the articles collected from the search engine are similar and relevant to each other. These items provided a sufficient amount of data to allow a more in-depth exploration of the aim and question of the study.

Confirmability is the interpretation of the findings does not involve the presumptions and bias of the researcher. The proponent of the study has followed a systematic approach of analyzing the contents of the articles and the ethical standards in using documents or articles for the study . Also, the categories were formed with the guidance of the supervisor.

Lastly, authenticity involves fairness and faithfulness of the study to the true testification of the participants and aid to widen their understanding of the world. The articles have been read twice to aid in profoundly understanding the points of the authors. Also, to keep the data gathered from the materials as close as it should be with its true meaning.

# 9 Conclusion

The purpose of the study which is to investigate the factors that support the adherence and maintenance of self-care management among older adults with diabetes mellitus was decided in a fast manner as the proponent of the study had a tight deadline. However, the proponent of the study still made sure to create a systematic and logically study.

Diabetes mellitus, which affects people with different ages, is an exciting subject for the proponent to discusses. Self-care management was also chosen to be investigated as the available articles are easier to look for and understand although it can be a broad and a complex concept. The following concepts have been chosen as they are the interests of the proponent to research on and to discuss.

The proponent chose a literature review study with deductive content analysis also due to the time constraints. However, as the proponent started the search for the selected articles, it did not turn out to be easy and fast as diabetes mellitus is a disease which is also very broad to discuss. The method of the study has given the proponent the opportunity to understand the concepts in the study profoundly. Although, there are still a lot of dimensions of the self-care management of diabetes mellitus which may include such as culture, geographical location, sociology, health and sociopolitical system, education, psychology and a lot more that can be taken into consideration. Thus, the study recommends other active researchers to tackle about the said dimensions of the study topic.

Also, a good indication of successful self-care management does not rely only on the perception and experiences of the patient but as well as a standard range of laboratory results of blood glucose testing and the alleviation or prevention of complications which can be obtained through a quantitative approach.

The articles that have been used for the study are not all similar. Some of them are quite broad but can still be related to the study, and some are specific which are still under the concepts of the study. However, there are still significant results that were gathered. These results can be used by the nurses and students, especially those who specialize in diabetic care management, to be an effective teacher and support to the patients. This study can also help nurses to form a more effective relationship with other health care team members in diabetes mellitus management.

The proponent of the study also recommends the implementation of a continuous diabetes health programs and courses that are personalized and holistic as one of the management of diabetes.

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# Appendices

## Appendix 1. Matrix of data collection

| Date | Database | Search Words | Hits | Used |
|---|---|---|---|---|
| 17.11.2017 | CINAHL | Diabetes Management | 95 | 3 |
| 17.11.2017 | EBSCOhost | Diabetes Older Adults | 18 | 1 |
| 17.11.2017 | EBSCOhost | Older Adults Chronic Disease Adherence | 21 | 1 |
| 17.11.2017 | EBSCOhost | Medical Adherence Older Adults | 108 | 1 |
| 17.11.2017 | EBSCOhost | Diabetes Management Older Adults | 108 | 1 |
| 17.11.2017 | EBSCOhost | Adherence Factors Older Adults | 76 | 1 |
| 17.11.2017 | EBSCOhost | Diabetes Self Management Adherence | 81 | 2 |

## Appendix 2. Matrix of articles used for the study

| Author & Journal | Name of the Study | Aim | Method | Result |
|---|---|---|---|---|
| Korkiakangas, E., Taanila, A. & Keinänen-Kiukaanniemi, S. (2011)<br><br>*Health & Social Care In The Community, 19(1)* | Motivation to physical activity among adults with high risk of type 2 diabetes who participated in the Oulu substudy of the Finnish Diabetes Prevention Study. | The objective of the study was to found out the motivators and barriers to physical activity among individuals with high risk of type 2 diabetes. | Qualitative study: inductive content analysis | The study has shown that weight management, the physical and mental well being and social relationships impacted the motivators to physical activity. Counselling and positive experiences of exercise strengthen the promotion of physical activities. |
| Oftedal, B. (2014)<br><br>*European Diabetes Nursing, 11(2)* | Perceived support from family and friends among adults with type 2 diabetes. | The study wants to find out how do adults with type 2 diabetes see the support given by family and friends and | Descriptive qualitative design | The findings of the study have shown that participants have seen the support from family and friends helpful and valuable and it motivates them to |

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| | | how can this impact the diabetes management of the patient. | | perform proper diabetes management. |
| Hsu, Clarissa, Jaclyn M Lemon, Edwin S Wong, Elizabeth Carson-Cheng, Mark Perkins, Margaret S Nordstrom, Chuan-Fen Liu, Carol Sprague, and Christopher L Bryson (2014)<br><br>*BMC Health Services Research, 14(1)* | Factors affecting medication adherence: patient perspectives from five veterans affairs facilities. | The study investigated the perspectives of Veterans Affairs patients about the factors that facilitate and impedes compliance to Oral Hypoglycemic Agents. | Focus groups exploration | Efficient pharmacy service and some particular methods for distributing medicines, giving pillboxes and copy of medicine list are vital system-level facilitators. |
| Meranius, M. S., & Hammar, L. M. (2016)<br><br>*Scandinavian Journal of Caring Sciences, 30(1)* | How does the healthcare system affect medication self-management among older adults with multimorbidity? | The study intends to explain how the health care system impacts the self-care of adults with multiple diseases. | In-depth interviews with the hermeneutic approach. | The study result has shown the role of the healthcare system in the treatment and relief of the symptoms of the patient but not in long-term health goals such as support and promotion of good health in daily |

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| | | | | living. |
| Holt E, Rung A, Leon K, Firestein C, Krousel-Wood M (2014)<br><br>*Educational Gerontology, 40(3)* | Medication Adherence in Older Adults: A Qualitative Study. | The study aims to have a deeper understanding of the barriers to medication adherence among older adults with cardiovascular health and look for possible solutions to promote management adherence. | Focus group **study** | The barriers to adherence include cognitive difficulties, personal and cultural beliefs, side effects, kind of social support, relationship with health care team, and the process of medication filling. |
| Moser, A., van der Bruggen, H., Widdershoven, G., & Spreeuwenberg, C. (2008)<br><br>*BMC Public Health 8(1)* | Self-management of type 2 diabetes mellitus: a qualitative investigation from the perspective of participants in a nurse-led, shared-care programme in the Netherlands. | The objective of the study is to present self-management concept related to the autonomy of people with type 2 diabetes. | Qualitative descriptive, and exploratory design with an inductive approach | The study has found out three kinds of processes in self-management which are connected and repetitive; the daily method includes the adherence, adaptation, and action repetitively, off-course method comprises |

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|---|---|---|---|---|
| | | | | awareness, finding reasons, decision-making, action, and evaluation, while the preventive process consists of the experiences, lessons, cautiousness, and practical aspect. |
| Mladenovic, A. B., Wozniak, L., Plotnikoff, R. C., Johnson, J. A., & Johnson, S. T. (2014)<br><br>*Practical Diabetes, 31(9)* | Social support, self-efficacy, and motivation: a qualitative study of the journey through HEALD (Healthy Eating and Active Living with Diabetes). | The purpose of the study is to how social support impacts the self-efficacy and motivation to exercise Before, during and after the **Healthy Eating** and **Active Living** for **Diabetes (HEALD) in the primary care program.** | Semi-structured interviews | The findings have shown the positive effect of support from the physical trainers and peers to the self-efficacy and motivation of the participants in performing exercises. But, the perceived improvements diminished as soon as the HEALD program stopped. |
| de Souza, D. L., & Vendruscolo, R (2010) | Adherence to a Physical Activity Program by Older Adults in Brazil. | The study aims to study the factors that promote | Semi-structured in-depth interviews | The result of the study presented that the participants want |

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| *Physical Educator, 67(2)* | | exercise adherence among older adults in Brazil. | with open-ended questions | to look after their physical and mental health and it was an excellent opportunity to socialize with people who are in the same age-range which promotes support, sharing of experiences and exchange of ideas that add new meanings and reasons to their lives. |
| Rise, M. B., Pellerud, A., Rygg, L. Ø., & Steinsbekk, A. (2013)<br><br>*Plos One, 8(5)* | Group-Based Type 2 Diabetes Self-Management Educations: A Qualitative Study. | The study examines how a group-based type 2 diabetes self-management course will promote lifestyle change and maintenance of the participants. | Qualitative semi-structured interviews | The three factors that affect lifestyle changes include learning new concepts, being responsible, and verification from others who practice healthy lifestyle while four elements encouraged participants to sustain the changes including social support, experiencing results from the |

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| | | | | new lifestyle, fear of disease complications and to form new habits. |
| Peeters, B, Van Tongelen, I, Duran, Z, Yüksel, G, Mehuys, E, Willems, S, Remon, JP, & Boussery, K (2015) | Understanding medication adherence among patients of Turkish descent with type 2 diabetes: a qualitative study. | The study aims to discover how Turkish immigrants with type 2 diabetes mellitus view Oral Hypoglycemic Agents compliance. | In-depth interviews with 21 T2DM **patients** of **Turkish descent.** | The study has discovered that the distinctive barriers to OHA adherence among Turkish DM type 2 patients tell about their causal views about stress and the Belgian climate. The season and religious happening affect adherence to OHA. Some participants use herbal medicine as they less confidence about OHA. Interpreting diabetes in a religious context also promoted feelings of depression, non-adherence and adherence to some. |